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**Stephens, N., Holyoake, C., Duignan, P., Finn, H., Salgado, C. and Bejder, L. (2010) *An unusual mortality event involving Bottlenose Dolphins (*Tursiops aduncus*) within the Swan Canning Riverpark June-October 2009*. In: Australian Society for Veterinary Pathology Annual Conference, 3 - 5 September, Fremantle, Western Australia.**

Presentation

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# **An unusual mortality event involving Bottlenose Dolphins (*Tursiops aduncus*) within the Swan Canning Riverpark June-October 2009**

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**Adult female 'Leeuwin,' Waylen Bay, 25<sup>th</sup> October 2009**

(image courtesy of Simon Allen, Murdoch University)

# Introduction & ecology

- 6 bottlenose dolphin deaths in 2 clusters – 3 in June 2009 and 3 in Sept-Oct 2009
- 4 had significant gross/histopathological findings
- Represent a marked  $\uparrow$  in dolphin mortalities based on previous stranding data
- Likely to be biologically significant to the resident population due to:
  - Small size of resident dolphin community (20-25 individuals)
  - Site fidelity and natal philopatry





# Factors that adversely impact on dolphin health

- Shark predation
- Human-induced injury
- Anthropogenic stressors (noise, vessel traffic)
- Physiological stress from environmental conditions
- Algal biotoxins
- Infectious disease
- Low genetic diversity?
- Contaminants?

***Estuaries are inherently stressful & challenging environments***

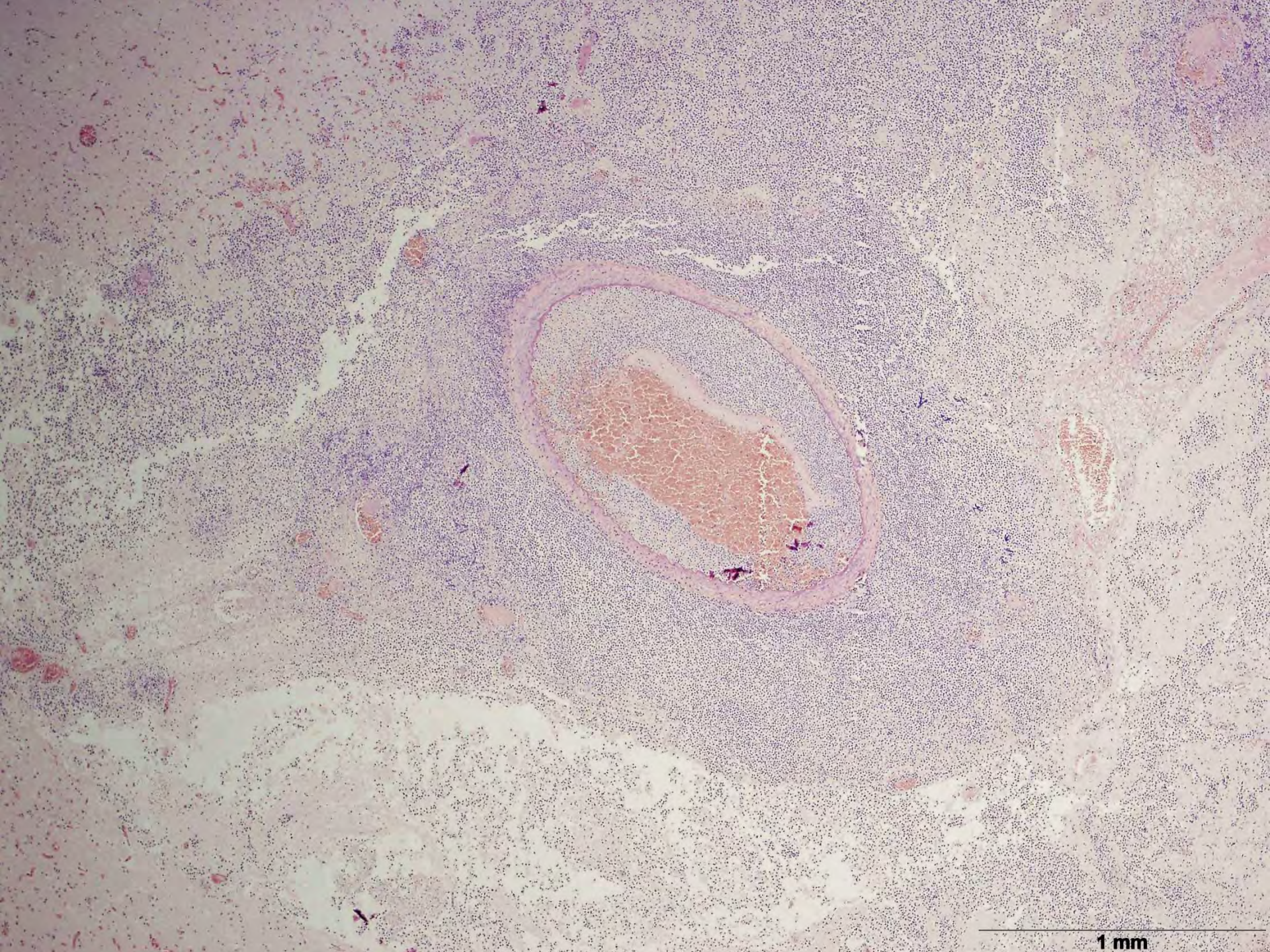
# Dolphin (1)

## **Male juvenile (09/637)**

- At least 3 years old
- Good BCS
- June

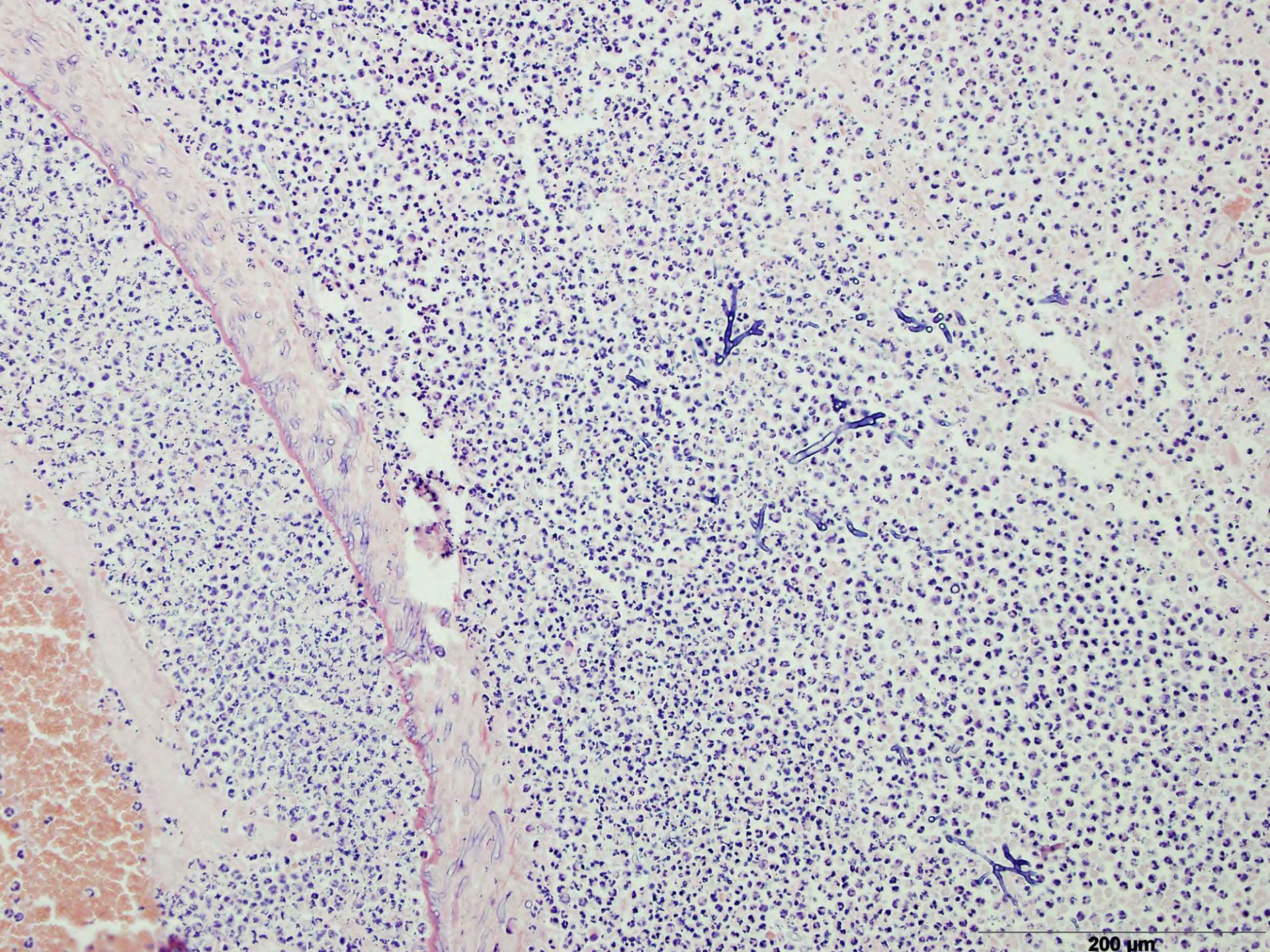






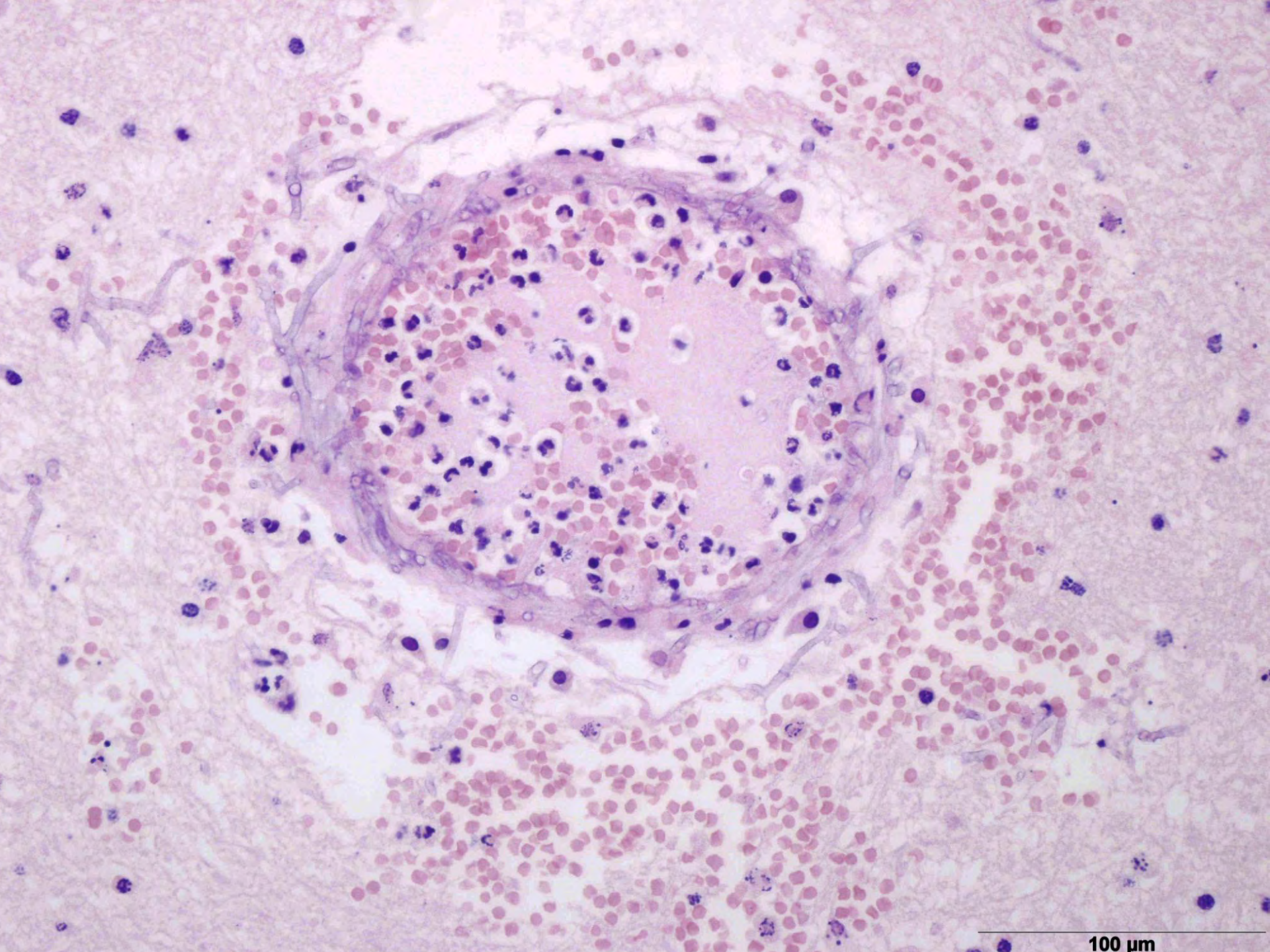
1 mm





200 μm





100  $\mu$ m





09/637

# Dolphin (2)

## Female adult (09/664)

- At least 16 years old
- Good BCS
- June





091664

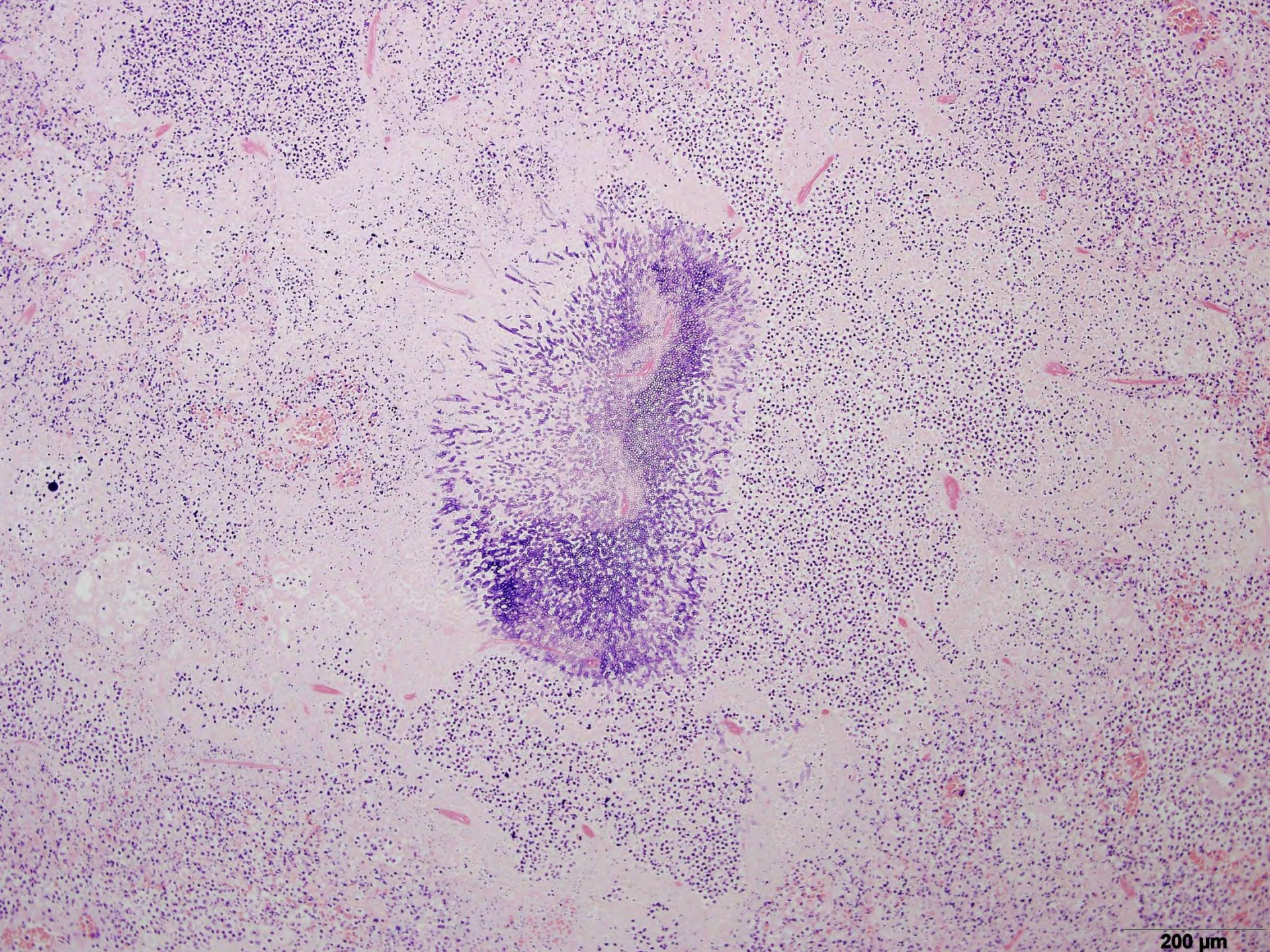




09 664

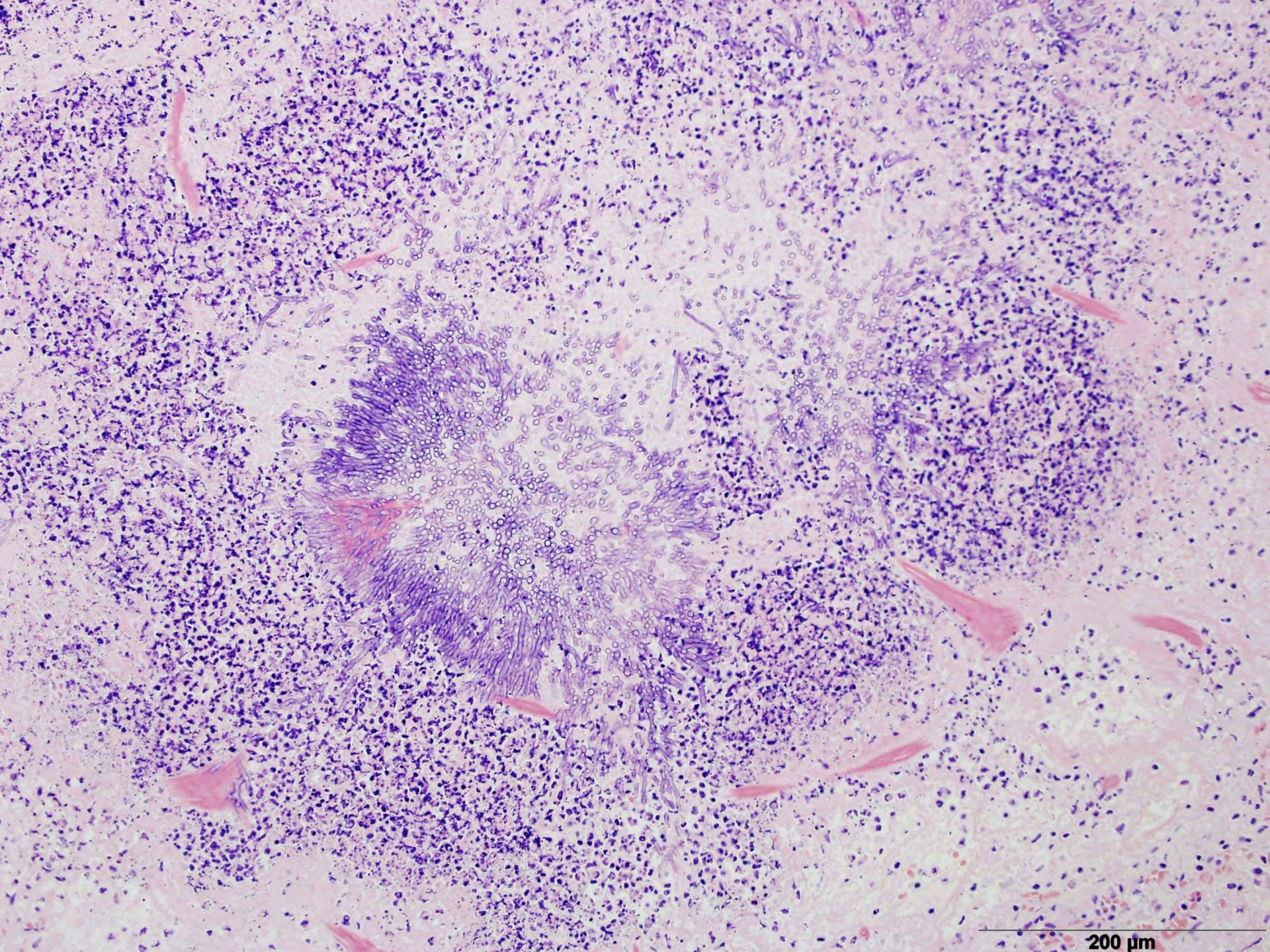
This image shows a gross pathology specimen, likely a tumor, characterized by a dark, hemorrhagic, and necrotic mass. The mass is surrounded by various tissues, including what appears to be the lung on the right, showing pale, lobulated structures. A white label with the handwritten number '09 664' is placed at the bottom of the specimen.





200 μm





200 μm



# Dolphins (3 & 4)

(Both Sept-Oct)

## **Female adult (AS-09-2912-F-V1)**

- Dental aging not done
- Reasonable BCS

## **Female adult (09/1108)**

- Dental aging not yet completed
- Poor BCS

**Image courtesy of Dr Simone Vitali,  
Perth Zoo & Dr Richmond Loh, Dept of  
Agriculture and Food**





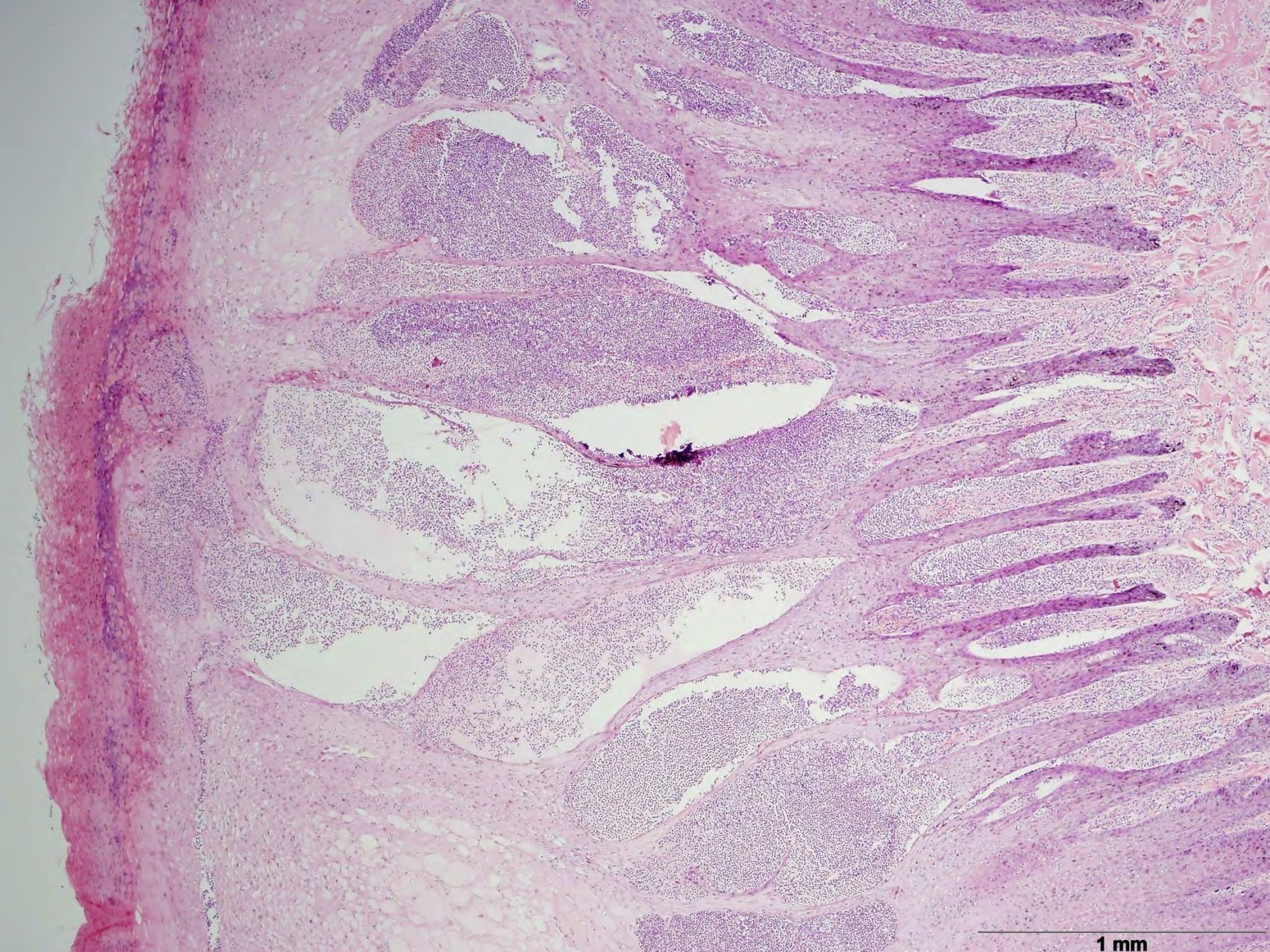


0911108



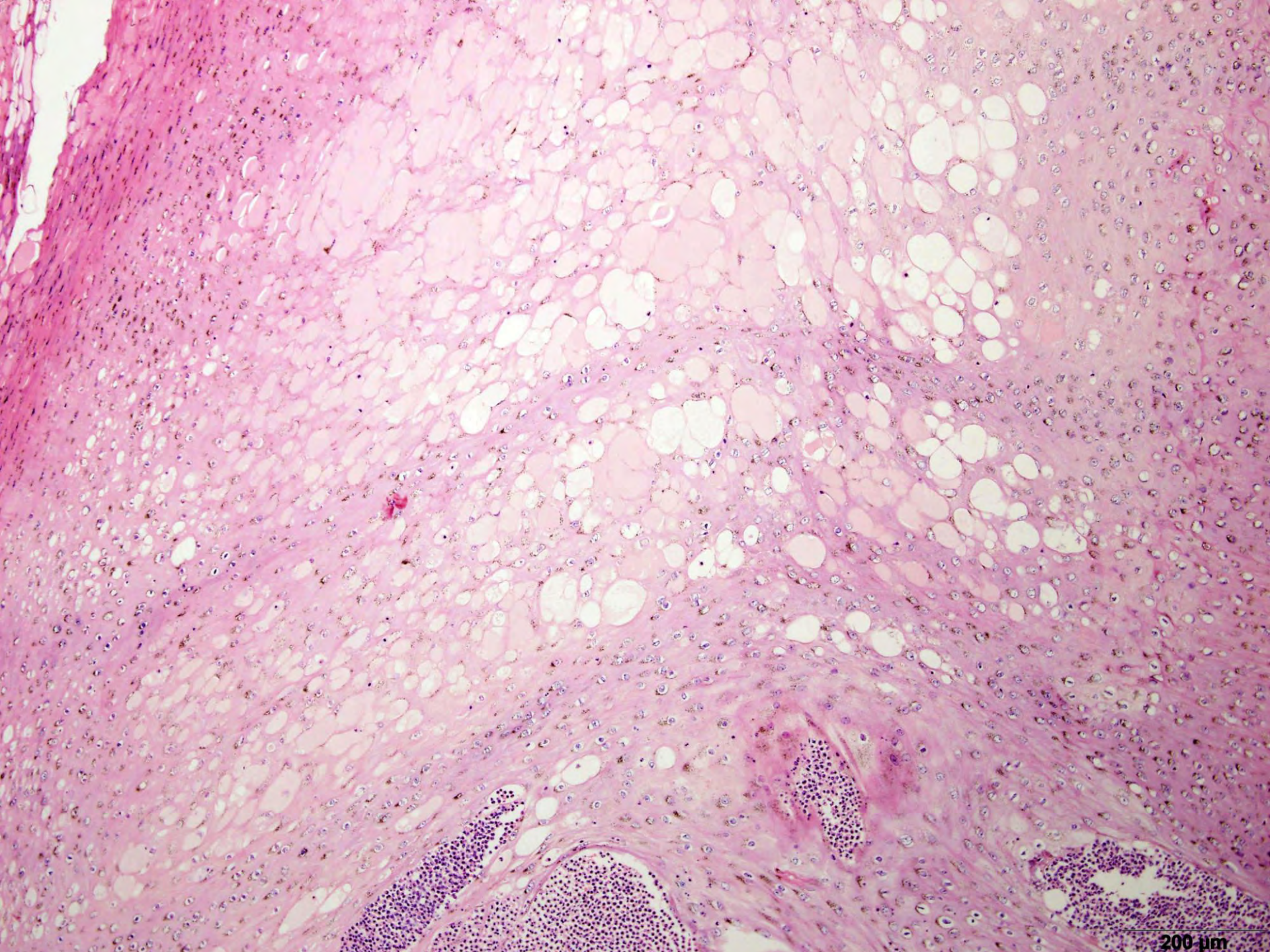






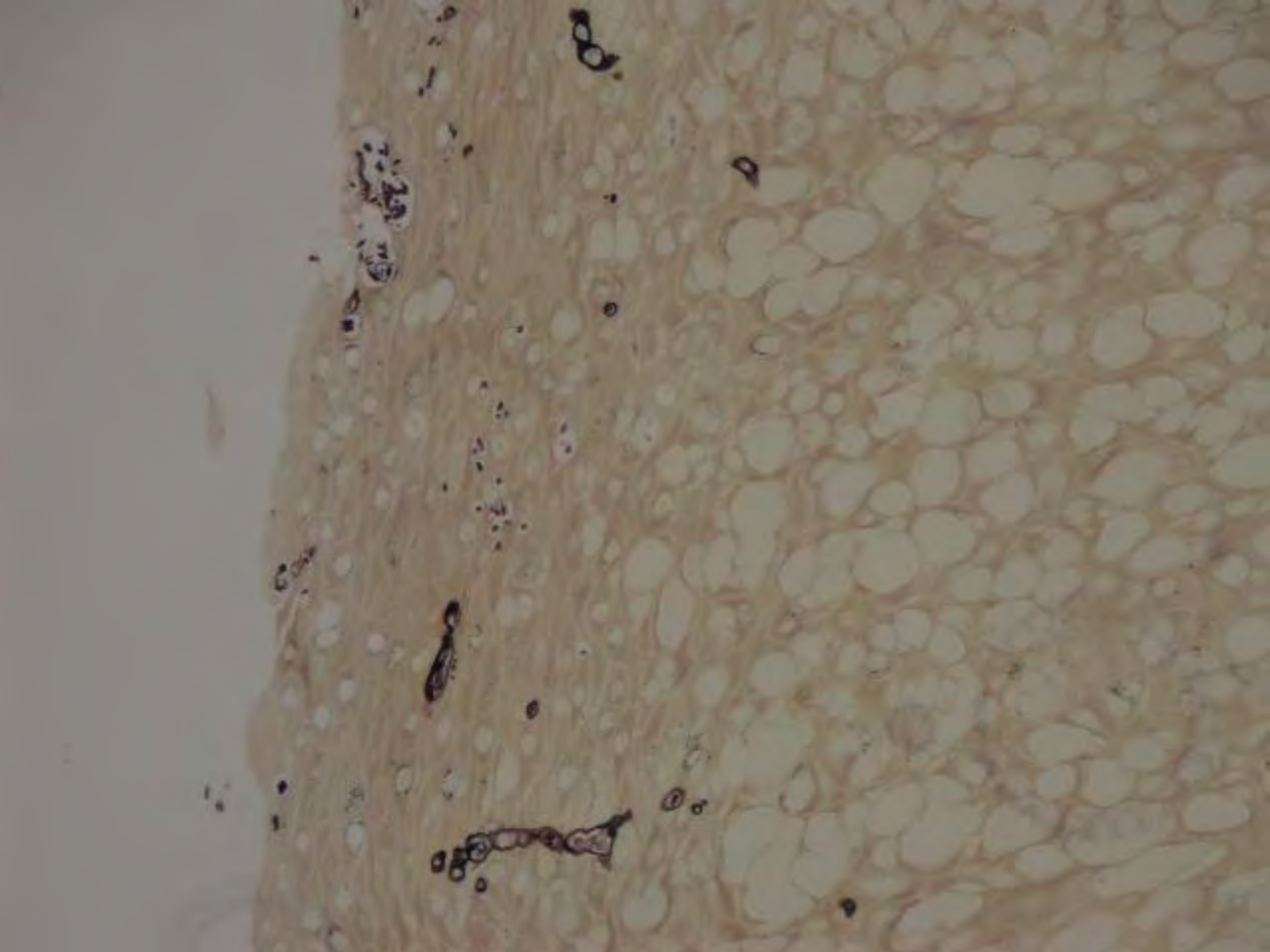
1 mm



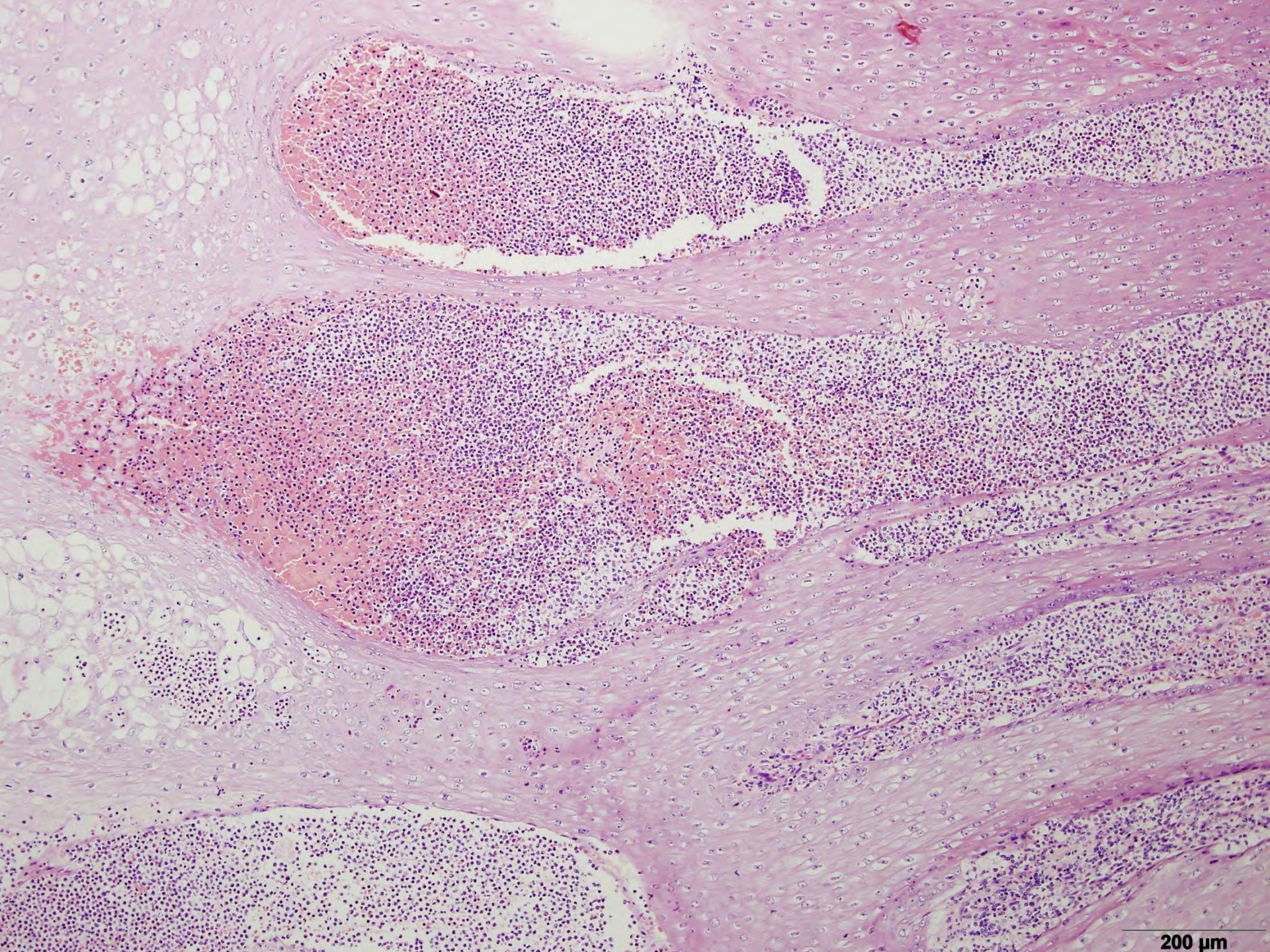


200 μm



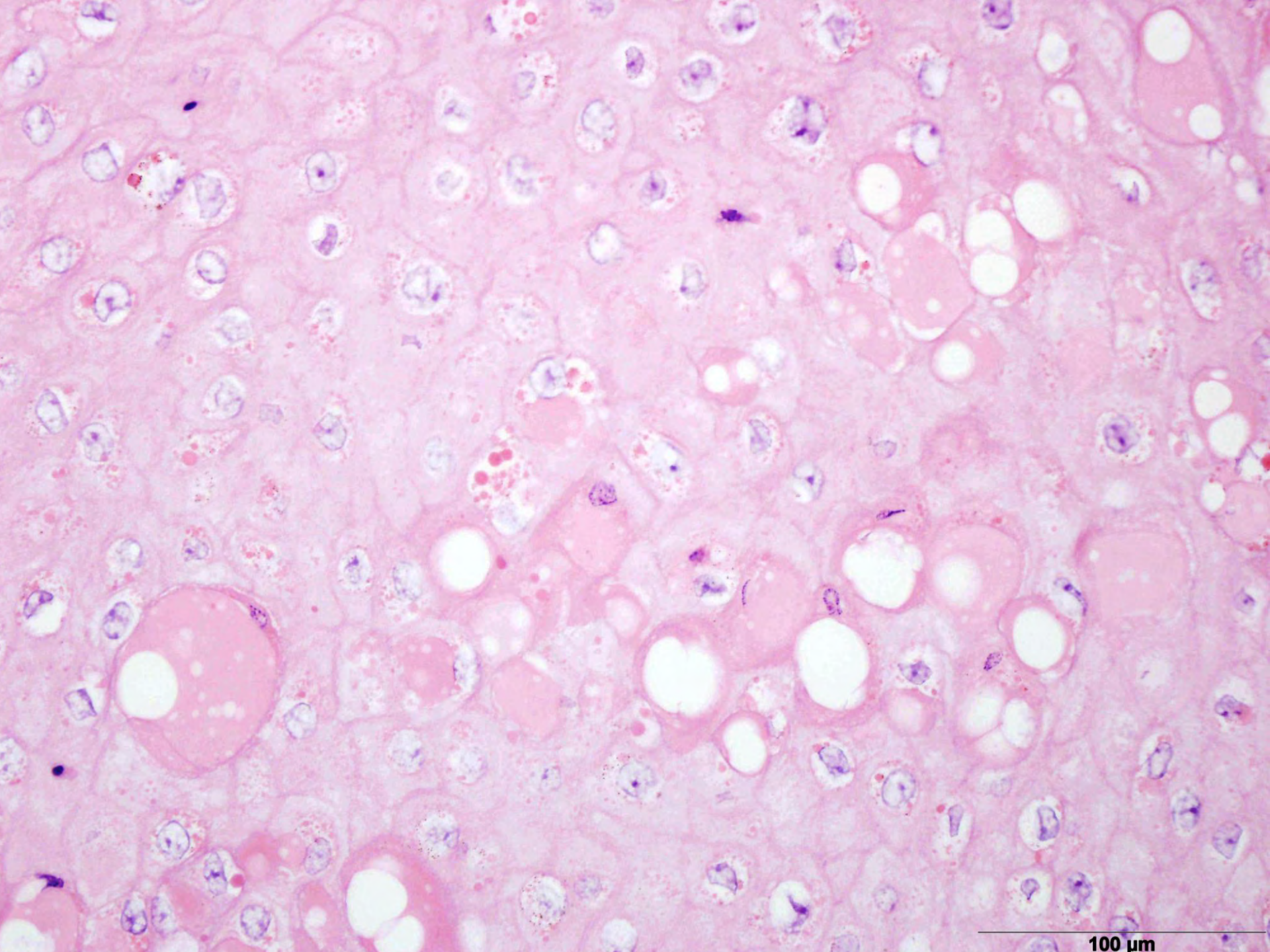






200  $\mu$ m





100  $\mu$ m









**Image courtesy of Kate Charlton-  
Robb, Monash University**

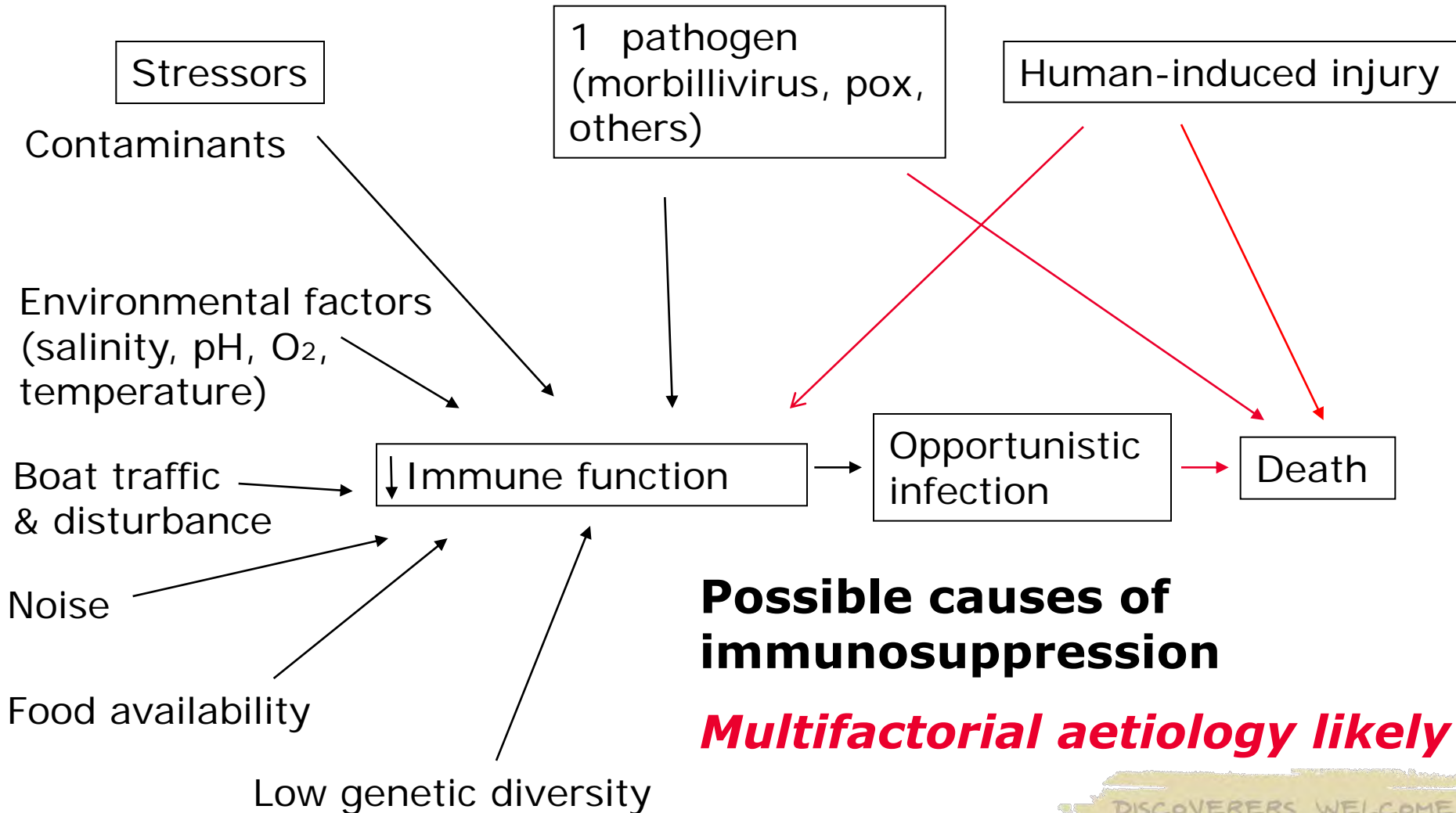


# Atypical TSD – the role of contaminants/others

- Osmotic epidermal damage
- ↑ poxvirus virulence
- Unidentified intercurrent immunosuppressive viruses (eg: morbillivirus)
- Organic contaminants:
  - Dieldrin - extremely high
  - DDE & PCBs - comparable to other populated coastal areas
- Heavy metals: Zn ↑



# Conclusions





# Future directions & acknowledgments

- Ongoing necropsies
- Compare to control 'pristine' population
- Repeat EM
- Morbillivirus IHC (Dr Tony Patterson)
- Viral microarray (Dr Joe DeRisi)
- Isolate/sequence poxvirus

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**The Technical Report (PDF format) on the 2009 bottlenose dolphin deaths in the Swan Canning Riverpark is available to the public in two parts at: [http://www.swanrivertrust.wa.gov.au/media%20release/dolphin\\_report.aspx](http://www.swanrivertrust.wa.gov.au/media%20release/dolphin_report.aspx)**